

### Chapter 3.1 WATER QUALITY ASSESSMENT SUMMARY

Virginia has nine major river basins with an estimated 50,527 miles of perennial rivers and streams and approximately 2,557 square miles of estuaries. These figures were calculated utilizing the Environmental Protection Agency (EPA) National Hydrography Database (NHD). This new and improved hydrography database has provided additional geographical refinement of rivers, streams, lakes and estuarine waters in Virginia. This is the reason that the overall stream mileage in the state has slightly increased from previous reported stream mileage calculation.

The overall water quality for Virginia is assessed based on whether or not the condition of the waterbody being assessed permits citizens to safely enjoy the designated uses of the waters as described in the Virginia Water Quality Standards. Table 3.1-1 briefly describes the designated uses and the baseline criteria used in this assessment to demonstrate support of the designated uses.

**Table 3.1-1 DESIGNATED USE MATRIX**

NO.	DESIGNATED USE	SUPPORT OF USE DEMONSTRATED BY
1	Aquatic Life Use	Conventional Pollutants (Dissolved Oxygen, pH, Temp.); Toxic contaminants in water column; Nutrients and toxic contaminants found in sediments; Biological evaluation.
2	Fish Consumption Use	Advisories, limiting consumption, or restrictions issued by Virginia Department of Health (VDH); Comparison of fish tissue data to state screening values for toxic pollutants found in Tables 6(a) and 6(b) of the Water Quality Assessment Guidance Manual
3	Shellfish Consumption Use	Restrictive actions for harvesting and marketing of shellfish resources made by the VDH Div. of Shellfish Sanitation.
4	Swimming Use	Conventional Pollutants, (Fecal Coliform, E. Coli and/or enterococci); beach closures issued by VDH
5	Public Water Supply Use	Closures or advisories by VDH; comparison of data to applicable public water supply standards
6	Wildlife Use	Aquatic life toxics criteria in water column

The assessment begins by analyzing all quality assurance/quality control (QA/QC) approved data from DEQ ambient water quality, biological, sediment and fish tissue monitoring, other special studies and/or other non-DEQ water quality data, including citizen monitoring data, for the 5-year assessment period. Citizen monitoring data is evaluated for use in the assessment using a process outlined in Part VI, Section 6.3.1 of the 2004 Assessment Guidance Manual. The results of these comprehensive data analyses are compared to both numeric and narrative criteria related to the designated uses contained in the Water Quality Standards (WQS). The WQS are provisions of State and/or Federal regulations that contain numeric and/or narrative criteria for protecting the designated uses of all waters in the Commonwealth.

In performing the assessment of chemical data summarized in this report, DEQ used the EPA Percent Method with a slight modification for small datasets. For additional information on the methodologies used in the assessment, see Chapter 2.2 of this report.

Many aspects of this assessment process are the same as previous assessments but several changes or enhancements have been implemented for this reporting period, which are different from previous assessments. First and foremost, the overall assessment of water quality, once again, incorporates a five-year period. Earlier assessments had been based on a two-year period which made it very difficult to accurately assess water quality because the number of sampling data points available were limited. By going to a five-year assessment period, more data points are available and a better analysis of the data can be performed.

As in 2002, the 2004 fish tissue assessment has deemed two or more exceedences of the same toxic criterion based tissue value (TV) at a site may be assessed as impaired since the TV's are directly calculated from the "human health" Water Quality Criteria for Surface Waters (9 VAC 25-260-140). For additional information regarding fish tissue assessment, see Section 6.5.2 of the Water Quality Assessment Guidance Manual.

In addition to the previously described enhancements, revisions to the 305(b)/303(d) guidance manual have enhanced assessment quality and consistency among DEQ offices and programs and provides the public with assessment criteria used to determine designated use attainment. The revised manual was public noticed in August 2003 and DEQ received numerous comments on the initial updated draft manual. Additional revisions were made to the guidance manual based on comments received. DEQ re-released the revised manual, based on the original comments, for a second public review, in November 2003. The 2004 Assessment Guidance Manual can be found on the DEQ website at: [www.deq.virginia.gov/wqa/](http://www.deq.virginia.gov/wqa/)

If a chemical, biological or tidal waters data package cannot be used in the assessment process, the appropriate DEQ staff will provide the data generator an explanation for the data not being useable. A list of all data providers and the status of the QA/QC review is included in Appendix D of the 2004 Integrated Report.

Statewide summaries of the river miles, estuarine square miles, and lake/reservoir acres within and/or bordering Virginia are presented in Tables 3.1-2 through 3.1-4. Support of the overall uses for each waterbody was determined by examining the support of up to six designated uses (see Table 3.1-5), as appropriate, for each waterbody.

As in previous 305(b) assessment reports, conventional pollutant data (DO, pH, temperature, bacteria and nutrients) continued to make up the bulk of the data used. Conventional pollutant data were collected and assessed from DEQ monitoring stations along with "quality assured/quality controlled" (QA/QC) approved monitoring data from other federal, state, municipal and citizen monitoring programs and compared to Virginia's Water Quality Standards. DEQ used the percentage procedure, as recommended by EPA guidance, to determine the degree of use support for conventional pollutant data.

The assessment is objective except where professional judgement indicates that natural causes are responsible for the violations (or the data quality are suspect). For the 2004 assessment cycle, Virginia used the trophic state index (TSI) to determine if natural conditions relative to lakes/reservoirs were responsible for natural dissolved oxygen (DO) impairments due to stratification. Waters not meeting the DO standards in bottom waters due to natural stratification and not excess nutrients are listed as impaired (Category 4C). These waters will not be considered for TMDL development but will need to have the DO standard adjusted for the specific waterbody, based on the natural background conditions. For DO, the instantaneous minimum standard found, in 9 VAC 25-260-50 (see Table 2.1-1), was used to assess compliance. A description of the types of data and the acceptable criteria used to determine the proper degree of use support result for each water type is described in Chapter 2.2 of this report. It should be noted that a single Category or Subcategory is assigned to each segment or assessment unit. Since each assessment unit has multiple designated uses, the worst case Category (Category 5) for any designated use will override all other Categories for that segment.

The degree of use support were classified as follows:

#### **Not Assessed**

Waters with no data for any of the designated uses or a single sample (conventional data only) were not assessed (Category 3A).

### **Insufficient Information**

Waters, where some ancillary data are available but is insufficient to determine if designated uses are being met, are considered insufficient for water quality determination (Category 3B). Waters that have QA/QC approved data with a single exceedence in a small data set (2-9 samples) are considered insufficient data (Category 3B). Additionally, waters where the citizen monitoring data are not QA/QC approved but the assessment results from the data review indicate no water quality problems are also considered insufficient (Category 3D).

### **Insufficient Information with Observed Effects**

Waters, where citizen monitoring data are not QA/QC approved but the assessment results from the data indicate potential water quality problems, are considered insufficient but having observed effects (Category 3C).

### **Fully Supporting**

QA/QC approved data that do not show excess exceedences are assessed waters as fully supporting the designated use(s). These waters would be placed in the federal Category 2 and Virginia subcategory 2A unless all designated uses are fully supporting, upon which the water would be placed in Category 1.

### **Fully Supporting with Observed Effects**

QA/QC approved data where a WQ Standard does not exist but data exceeds state screening criteria is considered fully supporting but having observed effects. Additionally, a single exceedence of a toxic criterion within a 3-year period is also considered fully supporting but having observed effect. It is the intent of the agency to focus additional monitoring resources on the waters that are identified as having an observed effect, based on initial monitoring data analysis. These waters would be placed in the Federal Category 2 and the Virginia Subcategory 2B.

### **Impaired Waters Not Needing a TMDL**

Waters impaired by pollution or natural conditions are impaired but do not need a TMDL. Additionally, those waters that have completed an EPA approved TMDL for specified pollutant or have other pollution control requirements that are expected to result in attainment of the WQ Standards by the next reporting period are considered impaired but not needing a TMDL. These waters are placed in the federal Category 4A, (TMDL complete for a specific pollutant), 4B (control requirements in place) or 4C (pollution and/or natural conditions).

### **Impaired Waters Needing a TMDL**

Waters impaired by pollutant(s) exceeding WQ Standards and needing a TMDL. These waters are placed in federal Category 5 (needing a TMDL) and the Virginia subcategories of 5A, 5B, 5D and possibly 5C and 5E.

Table 3.1-5 provides an overall summary of all waters assessed for each of the designated uses. Total size of Virginia's rivers and streams was calculated to be approximately 50,527 miles. For the 2004 assessment, DEQ used the Assessment Database (ADB 2.1.2) that EPA has provided the states. This version is based on designating an overall assessment category for each waterbody or assessment unit. Each designated use that has associated monitoring data is evaluated and an overall assessment category is determined based on the results of the individual designated use results. As previously pointed out, Category 5 overrides all other categories in the overall assessment unit determination.

Further geographical re-indexing and use of the National Hydrologic Database (NHD) has slightly increased the actual number of stream miles within the state from previous reports. The stream mile delineation guidance has provided consistent guidelines for associating the mileage assessed, relative to a specific sampling station. This is especially important where there are no easily identifiable changes in watershed characteristics. In some cases, the stream miles associated with a sampling station have been conservatively reduced from previous assessment reports. The stream mile delineation found in this report are only reflective of the 2004 assessment period but follow closely

with the monitoring efforts reported in the 2002 report.

The total size of estuarine waters was approximately 2,557 square miles. Coverage of coastal shore miles remained at 120 linear shore miles. An increased effort to assess one or more designated uses in the 100 most significant public lakes was accomplished. A total of 117,600 significant reservoir/lake acres were calculated to exist in Virginia. It should be noted that the lake/reservoir total acres have decreased from previous reports due to the delineation of only the Virginia portions of Lake Gaston and Kerr Reservoir. The North Carolina portion of these lakes had been included in the total lake/reservoir acres in previous reports. Table 3.1-5 summarizes the overall designated use assessments of Virginia's waters to determine the degree of use support for aquatic life, fish consumption, shellfish consumption (where applicable), swimming, public water supply (where applicable) and wildlife uses. Table 3.1-6 lists the causes for those waters resulting in less than full support of the Clean Water Act goals and state Water Quality Standards.

Impairment causes and/or sources can be caused by a "major impact", defined as that which causes a significant impairment to the waterbody or moderate and minor impacts. Normally, a major impact would be from a sole source with a large pollutant(s) contribution. Moderate and minor impacts have a slight to moderate effect on the waters and may be from a single moderate contributor or a combination of several minor contributors. It is important to note that moderate and minor impacts can, under certain conditions, work in conjunction to cause a major impact.

As previously stated, the causes and sources of use impairment of Virginia's waters, resulting in less than full support of Clean Water Act goals, are summarized in Tables 3.1-6 and 3.1-7. It is apparent, urban runoff and agricultural nonpoint sources are primary contributors of use impairment and major impacts. It is also important to point out that natural conditions have a major impact on water quality. Equally apparent, the primary pollutants causing use impairment are low dissolved oxygen from nutrient enrichment or natural stratification, pH problems associated with natural, low-flow, swamp waters, pathogen indicators and human health related Polychlorinated Biphenyls (PCBs) found in fish tissue. A new bacteria standard for recreational use was adopted during the 2004 reporting period and the bacteria indicators have been assessed according to the new, more stringent bacteria standard. A noticeable increase in bacteria related impairment, especially in rivers, has resulted. Additionally, the assessment of the probabilistic estuarine B-IBI (benthic) data during this reporting period has resulted in an increase in aquatic life impairment in estuarine waters.

Finally, one other assessment issue that did not affect the results of this report but will affect the results of the next report is the adoption of a new pH standard associated with Class 7 "swamp waters". The new pH standard became effective on February 12, 2004 but was not used in the 2004 assessment. Most of these swamp waters have been identified as naturally impaired, based on the previous pH criteria, but will likely meet the new standard for the next reporting period.

## Assessment Results

DEQ incorporated the Integrated Reporting guidance EPA developed in 2003 into the 2004 assessment. The assessment approach used in this report is substantially different from previous assessments and is designed to integrate or combine the 305b overall assessment of Virginia's waters and separate out those waters impaired and needing a TMDL (Total Maximum Daily Load) as per 303(d). The EPA 2004 Integrated Report guidance and Assessment Database (ADB 2.1.2) has 5 different categories, some with subcategories, in which every segment or "assessment unit" (AU) will be placed. The EPA Integrated Report guidance allows the states to further sub-divide the federal Categories in order to address state programmatic needs. Virginia created several additional subcategories in order to facilitate tracking. Tables, 3.1-2, 3.1-3, and 3.1-4 show the assessment results by waterbody type using all assessment categories and subcategories applicable for Virginia's 2004 Integrated Report.

Additional information regarding assessment methodologies and subcategories can be found in Chapter 2.2 of this report and/or the 2004 Assessment Guidance Manual found on the DEQ water website at [www.deq.virginia.gov/wqa](http://www.deq.virginia.gov/wqa).

**Table 3.1-2 Assessment Results for Rivers**

Degree of Use Support	Water Type	Total Miles (Rounded to the Nearest Whole Number)	(%)
Fully Support All Designated Uses ( <b>EPA Category 1</b> )	River (mi.)	228	0.4%
Fully Support Some Uses but Insufficient Data to Assess All Uses ( <b>EPA Category 2</b> )	River (MI)	4,208	8.3%
<i>Virginia Subcategory 2A</i>		2,895	
<i>Virginia Subcategory 2B</i>		1,313	
Insufficient Data to Determine if any Uses are Being Met ( <b>EPA Category 3</b> )	River (MI)	39,144	77.5%
<i>Virginia Subcategory 3A</i>		38,272	
<i>Virginia Subcategory 3B</i>		471	
<i>Virginia Subcategory 3C</i>		159	
<i>Virginia Subcategory 3D</i>		243	
Waters are Impaired but do not Need a TMDL ( <b>EPA Category 4</b> )	River (MI)	695	1.4%
<i>EPA Subcategory 4A</i>		671	
<i>EPA Subcategory 4B</i>		0	
<i>EPA Subcategory 4C</i>		24	
Waters are Impaired and Need a TMDL ( <b>EPA Category 5</b> )	River (mi.)	6,253	12.4%
<i>Virginia Subcategory 5A</i>		5,195	
<i>Virginia Subcategory 5B</i>		0	
<i>Virginia Subcategory 5C</i>		935	
<i>Virginia Subcategory 5D</i>		123	
<i>Virginia Subcategory 5E</i>		0	
<b>Total Size</b>	River (MI)	50,527	100%

**Table 3.1-3 Assessment Results for Lakes/Reservoirs**

<b>Degree of Use Support</b>	<b>Water Type</b>	<b>Total Acres (Rounded to the Nearest Whole Number)</b>	<b>(%)</b>
Fully Support All Designated Uses <b>(EPA Category 1)</b>	Lakes (acres)	2,718	2.3%
Fully Support Some Uses but Insufficient Data to Assess All Uses <b>(EPA Category 2)</b>	Lakes (acres)	7,217	6.1%
<i>Virginia Subcategory 2A</i>		6,600	
<i>Virginia Subcategory 2B</i>		617	
Insufficient Data to Determine if any Uses are Being Met <b>(EPA Category 3)</b>	Lakes (acres)	17,771	15.1%
<i>Virginia Subcategory 3A</i>		10,156	
<i>Virginia Subcategory 3B</i>		0	
<i>Virginia Subcategory 3C</i>		3,303	
<i>Virginia Subcategory 3D</i>		676	
Waters are Impaired but do not Need a TMDL <b>(EPA Category 4)</b>	Lakes (acres)	24,594	20.9%
<i>EPA Subcategory 4A</i>		180	
<i>EPA Subcategory 4B</i>		0	
<i>EPA Subcategory 4C</i>		24,414	
Waters are Impaired and Need a TMDL <b>(EPA Category 5)</b>	Lakes (acres)	65,300	55.6%
<i>Virginia Subcategory 5A</i>		60,753	
<i>Virginia Subcategory 5B</i>		0	
<i>Virginia Subcategory 5C</i>		4,546	
<i>Virginia Subcategory 5D</i>		0	
<i>Virginia Subcategory 5E</i>		0	
<b>Total Size</b>	Lakes (acres)	117,600	100%

**Table 3.1-4 Assessment Results for Estuarine Waters**

<b>Degree of Use Support</b>	<b>Water Type</b>	<b>Total Square Miles (Rounded to the Nearest Whole Number)</b>	<b>(%)</b>
Fully Support All Designated Uses <b>(EPA Category 1)</b>	Estuary (sq. mi.)	19	0.8%
Fully Support Some Uses but Insufficient Data to Assess All Uses <b>(EPA Category 2)</b>	Estuary (sq. mi.)	599	23.4%
<i>Virginia Subcategory 2A</i>		540	
<i>Virginia Subcategory 2B</i>		59	
Insufficient Data to Determine if any Uses are Being Met <b>(EPA Category 3)</b>	Estuary (sq. mi.)	32	1.3%
<i>Virginia Subcategory 3A</i>		31	
<i>Virginia Subcategory 3B</i>		1	
<i>Virginia Subcategory 3C</i>		0	
<i>Virginia Subcategory 3D</i>		0	
Waters are Impaired but do not Need a TMDL <b>(EPA Category 4)</b>	Estuary (sq. mi.)	0	0%
<i>EPA Subcategory 4A</i>		0	
<i>EPA Subcategory 4B</i>		0	
<i>EPA Subcategory 4C</i>		0	
Waters are Impaired and Need a TMDL <b>(EPA Category 5)</b>	Estuary (sq. mi.)	1,907	74.6%
<i>Virginia Subcategory 5A</i>		1,848	
<i>Virginia Subcategory 5B</i>		40	
<i>Virginia Subcategory 5C</i>		19	
<i>Virginia Subcategory 5D</i>		0	
<i>Virginia Subcategory 5E</i>		0	
<b>Total Size</b>	Estuary (sq. mi.)	2,557	100%

TABLE 3.1- 5

## OVERALL INDIVIDUAL USE SUPPORT SUMMARY TABLE

**Size: All Sizes Rounded to Nearest Whole Number**

Rivers – 50,527 miles

Lakes – 117,600 acres

Estuaries – 2,557 sq. miles

Designated Use	Water Body Type	Fully Supporting	Total Impaired	Naturally Impaired	Insufficient Information	Not Assessed	Size Assessed
<b>Aquatic Life</b>	River (mi)	7,265	3,173	1,357	819	39,270	10,438
	Lakes (acres)	11,379	85,333	54,211	4,618	16,270	96,712
	Estuary (sq. mi.)	384	1,823	28	32	317	2,207
<b>Fishing</b>	River (mi)	1,946	684	0	97	47,800	2,630
	Lakes (acres)	25,177	45,905	0	0	46,518	71,082
	Estuary (sq. mi.)	1,350	98	0	3	1,107	1,448
<b>Shellfishing</b>	River (mi)	-	-	-	-	-	-
	Lakes (acres)	-	-	-	-	-	-
	Estuary (sq. mi.)	2,155	75	0	0	43	2,230
<b>Swimming</b>	River (mi)	3,023	5,016	0	652	41,836	8,039
	Lakes (acres)	88,753	2,691	0	4,371	21,785	91,444
	Estuary (sq. mi.)	570	47	0	1	1,940	617
<b>Public Water Supply</b>	River (mi)	1,413	19	7	0	8,744	1,432
	Lakes (acres)	82,509	110	0	0	7,968	82,619
	Estuary (sq. mi.)	9	0	0	0	0	9
<b>Wildlife</b>	River (mi)	8,092	6	0	179	42,250	8,098
	Lakes (acres)	91,312	530	0	0	25,757	91,842
	Estuary (sq. mi.)	545	97	94	1	1,913	642



**TABLE 3.1-6 WATERS IMPAIRED BY VARIOUS CAUSE CATEGORIES**

<b>Pollutant</b>	<b>Type</b>	<b>Impaired (Rounded to Nearest Whole Number)</b>
<b>Aldrin</b>	River (mi)	7
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Ammonia</b>	River (mi)	1
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1
<b>Arsenic</b>	River (mi)	3
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Freshwater Benthic Assessment</b>	River (mi)	1,183
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Benzo(k)fluoranthene</b>	River (mi)	19
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Chlordane</b>	River (mi)	1
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Chloride</b>	River (mi)	33
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	96
<b>Copper</b>	River (mi)	1
	Lakes (acres)	530
	Estuary (mi <sup>2</sup> )	0
<b>DDE/DDT</b>	River (mi)	19
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Enterococcus Pathogen Indicators</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	3
<b>Escherichia coli Pathogen Indicators</b>	River (mi)	588
	Lakes (acres)	1,810
	Estuary (mi <sup>2</sup> )	2
<b>Fecal Coliform Pathogen Indicators</b>	River (mi)	4,886
	Lakes (acres)	1,066
	Estuary (mi <sup>2</sup> )	112
<b>Estuarine Benthic Assessment</b>	River (mi)	-
	Lakes (acres)	-
	Estuary (mi <sup>2</sup> )	596
<b>Iron</b>	River (mi)	7
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Lead</b>	River (mi)	7
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Manganese</b>	River (mi)	7
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Mercury</b>	River (mi)	275
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	2
<b>Nitrates</b>	River (mi)	2
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	96
<b>Nutrient/Eutrophication Indicators</b>	River (mi)	0
	Lakes (acres)	110
	Estuary (mi <sup>2</sup> )	274
	River (mi)	1,262
	Lakes (acres)	85,095

<b>Pollutant</b>	<b>Type</b>	<b>Impaired (Rounded to Nearest Whole Number)</b>
<b>Dissolved Oxygen</b>	Estuary (mi <sup>2</sup> )	1,358
<b>pH</b>	River (mi)	1,370
	Lakes (acres)	11,267
	Estuary (mi <sup>2</sup> )	7
<b>PCB's</b>	River (mi)	421
	Lakes (acres)	45,905
	Estuary (mi <sup>2</sup> )	96
<b>Phosphate</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	96
<b>Sulfates</b>	River (mi)	10
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Temperature</b>	River (mi)	285
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	-
<b>Tributyltin (TBT)</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	15

**TABLE 3.1-7 WATERS IMPAIRED BY VARIOUS SOURCE CATEGORIES**

<b>Source of Impairment</b>	<b>Type</b>	<b>Impaired (Rounded to Nearest Whole Number)</b>
<b>Acid Mine Drainage</b>	River (mi)	36
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Agriculture</b>	River (mi)	489
	Lakes (acres)	683
	Estuary (mi <sup>2</sup> )	0
<b>Animal Feeding Operations</b>	River (mi)	141
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Atmospheric Deposition- Acidity</b>	River (mi)	166
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Atmospheric Deposition- Nitrogen</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1,089
<b>Changes in Ordinary Stratification and Bottom Water Hypoxia/Anoxia</b>	River (mi)	0
	Lakes (acres)	11,351
	Estuary (mi <sup>2</sup> )	146
<b>Channelization</b>	River (mi)	3
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Combined Sewer Overflows</b>	River (mi)	38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	11
<b>Commercial Districts (Industrial Parks)</b>	River (mi)	3
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Contaminated Sediments</b>	River (mi)	121
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Dam or Impoundment</b>	River (mi)	44
	Lakes (acres)	1,380
	Estuary (mi <sup>2</sup> )	0
<b>Discharges from Municipal Storm Sewers</b>	River (mi)	122
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	12
<b>Drought-related Impacts</b>	River (mi)	14
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Grazing in Riparian or Shoreline Zones</b>	River (mi)	206
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Illegal Dumps or other Inappropriate Waste Disposal</b>	River (mi)	1
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Illicit Hookups/Connections to Storm Sewers</b>	River (mi)	14
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Impacts from Abandoned Mine Lands</b>	River (mi)	28
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Industrial Point Source Discharge</b>	River (mi)	134
	Lakes (acres)	1,090
	Estuary (mi <sup>2</sup> )	0
<b>Landfills</b>	River (mi)	2
	Lakes (acres)	

Source of Impairment	Type	Impaired (Rounded to Nearest Whole Number)
	Estuary (mi <sup>2</sup> )	0
		0
Leaking Underground Storage Tanks	River (mi)	2
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Livestock Grazing or Feeding Operations	River (mi)	133
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Loss of Riparian Habitat	River (mi)	87
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Managed Pasture Grazing	River (mi)	14
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Mine Tailings	River (mi)	7
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Urbanized High Density Area	River (mi)	596
	Lakes (acres)	908
	Estuary (mi <sup>2</sup> )	6
Municipal Point Source Discharges	River (mi)	115
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1,091
Natural Conditions – Water Quality Use Attainability	River (mi)	1,520
	Lakes (acres)	64,723
	Estuary (mi <sup>2</sup> )	108
Natural Sources	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	7
Non-Point Sources	River (mi)	1,615
	Lakes (acres)	252
	Estuary (mi <sup>2</sup> )	1,108
On-site Treatment Systems	River (mi)	175
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	6
Other Shipping releases (Wastes and Detritus)	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	15
Package Plant or other Permitted Small Flow Discharges	River (mi)	3
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Releases from Waste Sites or Dumps	River (mi)	4
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Residential Districts	River (mi)	21
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Sanitary Sewer Overflows	River (mi)	60
	Lakes (acres)	378
	Estuary (mi <sup>2</sup> )	0
Septage Disposal	River (mi)	31
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
Ship Building, Repairs, Drydocking	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	15
Source Unknown	River (mi)	3,306
	Lakes (acres)	58,856
	Estuary (mi <sup>2</sup> )	373

<b>Source of Impairment</b>	<b>Type</b>	<b>Impaired (Rounded to Nearest Whole Number)</b>
<b>Sources Outside State Jurisdiction or Borders</b>	River (mi)	0
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	1,089
<b>Streambank Modification or Destabilization</b>	River (mi)	41
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Surface Mining</b>	River (mi)	91
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Unpermitted Discharge (Domestic Wastes)</b>	River (mi)	5
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Upstream Impoundments (PI 566 NRCS Structures)</b>	River (mi)	2
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Upstream Source</b>	River (mi)	26
	Lakes (acres)	349
	Estuary (mi <sup>2</sup> )	0
<b>Wastes from Pets</b>	River (mi)	19
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Waterfowl</b>	River (mi)	38
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Wet Weather Discharges</b>	River (mi)	16
	Lakes (acres)	0
	Estuary (mi <sup>2</sup> )	0
<b>Wildlife other than Waterfowl</b>	River (mi)	1,624
	Lakes (acres)	683
	Estuary (mi <sup>2</sup> )	0